

Acoustic Emission measurement with fiber bragg gratings for structure health monitoring

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Abstract: Structural Health monitoring (SHM) is a way of detecting and assessing damage to large scale structures. Sensors used in SHM for aerospace structures provide real time data on new and propagating damage. One type of sensor that is typically used is an acoustic emission (AE) sensor that detects the acoustic emissions given off from a material cracking or breaking. The use of fiber Bragg grating (FBG) sensors to provide acoustic emission data for damage detection is studied. In this research, FBG sensors are used to detect acoustic emissions of a material during a tensile test. FBG sensors were placed as a strain sensor (oriented parallel to applied force) and as an AE sensor (oriented perpendicular to applied force). A traditional AE transducer was used to collect AE data to compare with the FBG data. Preliminary results show that AE with FBGs can be a viable alternative to traditional AE sensors.